

$\Sigma_c(2520)$ $I(J^P) = 1(\frac{3}{2}^+)$ Status: ***

Seen in the $\Lambda_c^+\pi^\pm$ mass spectrum. The natural assignment is that this is the $J^P = 3/2^+$ excitation of the $\Sigma_c(2455)$, the charm counterpart of the $\Sigma(1385)$, but neither J nor P has been measured.

 $\Sigma_c(2520)$ MASSES

The masses are obtained from the mass-difference measurements that follow.

 $\Sigma_c(2520)^{++}$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
2519.4 ± 1.5 OUR FIT				

• • • We do not use the following data for averages, fits, limits, etc. • • •

2530 ± 5 ± 5 6 ¹ AMMOSOV 93 HLBC $\nu p \rightarrow \mu^- \Sigma_c(2530)^{++}$

¹ AMMOSOV 93 sees a cluster of 6 events and estimates the background to be 1 event.

 $\Sigma_c(2520)^0$ MASS

VALUE (MeV)	DOCUMENT ID
2517.5 ± 1.4 OUR FIT	

 $\Sigma_c(2520)$ MASS DIFFERENCES **$m_{\Sigma_c(2520)^{++}} - m_{\Lambda_c^+}$**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
234.5 ± 1.4 OUR FIT				
$234.5 \pm 1.1 \pm 0.8$	677	BRANDENB... 97	CLE2	$e^+ e^- \approx \gamma(4S)$

 $m_{\Sigma_c(2520)^0} - m_{\Lambda_c^+}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
232.6 ± 1.3 OUR FIT				
$232.6 \pm 1.0 \pm 0.8$	504	BRANDENB... 97	CLE2	$e^+ e^- \approx \gamma(4S)$

 $m_{\Sigma_c(2520)^{++}} - m_{\Sigma_c(2520)^0}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1.9 ± 1.7 OUR NEW UNCHECKED FIT	[1.9 ± 1.9 MeV OUR 1998 FIT]		
$1.9 \pm 1.4 \pm 1.0$	² BRANDENB... 97	CLE2	$e^+ e^- \approx \gamma(4S)$

² This BRANDENBURG 97 result is redundant with measurements in earlier entries.

$\Sigma_c(2520)$ WIDTHS

$\Sigma_c(2520)^{++}$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$17.9^{+3.8}_{-3.2} \pm 4.0$	677	BRANDENB... 97	CLE2	$e^+ e^- \approx \gamma(4S)$

$\Sigma_c(2520)^0$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$13.0^{+3.7}_{-3.0} \pm 4.0$	504	BRANDENB... 97	CLE2	$e^+ e^- \approx \gamma(4S)$

$\Sigma_c(2520)$ DECAY MODES

$\Lambda_c^+ \pi$ is the only strong decay allowed to a Σ_c having this mass.

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad \Lambda_c^+ \pi$	$\approx 100 \%$

$\Sigma_c(2520)$ REFERENCES

BRANDENB... 97	PRL 78 2304	G. Brandenburg <i>et al.</i>	(CLEO Collab.)
AMMOSOV 93	JETPL 58 247 Translated from ZETFP 58 241.	V.V. Ammosov <i>et al.</i>	(SERP)